C L A I M S

1. A CVD method of forming a silicon-containing insulating film, comprising:

supplying a film-formation gas into a process chamber that accommodates a target substrate, while exhausting an interior of the process chamber, thereby forming the insulating film on the target substrate by deposition, wherein a carbon hydride gas is supplied together with the film-formation gas.

2. The method according to claim 1, wherein the carbon hydride gas is at least one gas selected from the group consisting of acetylene, ethylene, methane, ethane, propane, and butane.

3. The method according to claim 2, wherein the carbon hydride gas consists essentially of ethylene, and supplied into the process chamber without pre-heating.

4. The method according to claim 1, further comprising pre-heating the carbon hydride gas to a predetermined temperature immediately before supplying the carbon hydride gas into the process chamber.

5. The method according to claim 4, wherein a temperature of the pre-heating is set to fall within a range of from 500 to 1000℃.

6. The method according to claim 1, wherein a flow rate ratio of the carbon hydride gas relative to the film-formation gas is set to fall within a range of

from 0.3 to 3.2.

7. The method according to claim 1, wherein the insulating film consists essentially of a film selected from the group consisting of a silicon oxide film, silicon nitride film, and silicon oxynitride film.

8. The method according to claim 7, wherein the film-formation gas comprises a first gas consisting essentially of a silane family gas, and a second gas consisting essentially of a gas selected from the group consisting of an oxidizing gas, nitriding gas, and oxynitriding gas.

9. The method according to claim 8, wherein the first gas consists essentially of a gas selected from the group consisting of hexachlorodisilane, hexaethylaminodisilane, bistertialbutylaminosilane, and dichlorosilane, the second gas consists essentially of a nitriding gas, and the insulating film is formed by deposition at a process temperature set to fall within a range of from 450 to 600℃.

10. A CVD method of forming an insulating film, consisting essentially of a film selected from the group consisting of a silicon oxide film, silicon nitride film, and silicon oxynitride film, the method comprising:

supplying first, second, and third gases into a process chamber that accommodates a target substrate, while heating and exhausting an interior of the process

chamber, thereby forming the insulating film on the target substrate by deposition, wherein the first gas consists essentially of a silane family gas, a second gas consists essentially of a gas selected from the group consisting of an oxidizing gas, nitriding gas, and oxynitriding gas, the third gas consists essentially of a carbon hydride gas, and a flow rate ratio of the third gas relative to the first gas is set to fall within a range of from 10 to 100.

11. A CVD apparatus for forming an insulating film, consisting essentially of a film selected from the group consisting of a silicon oxide film, silicon nitride film, and silicon oxynitride film, the apparatus comprising:

a process chamber configured to accommodate a target substrate;

a support member configured to support the target substrate in the process chamber;

a heater configured to heat the target substrate supported by the support member;

an exhaust section configured to vacuum-exhaust an interior of the process chamber; and

a supply section configured to supply a gas into the process chamber,

wherein the supply section comprises a first circuit configured to supply a first gas consisting essentially of a silane family gas, a second circuit

configured to supply a second gas consisting essentially of a gas selected from the group consisting of an oxidizing gas, nitriding gas, and oxynitriding gas, and a third circuit configured to supply a third gas consisting essentially of a carbon hydride gas, and is capable of supplying the first, second, and third gases at the same time.

12. The apparatus according to claim 11, wherein the supply section includes a pre-heating unit configured to pre-heat the third gas to a predetermined temperature immediately before supplying the third gas into the process chamber.